

TECHNOLOGY DEPT.

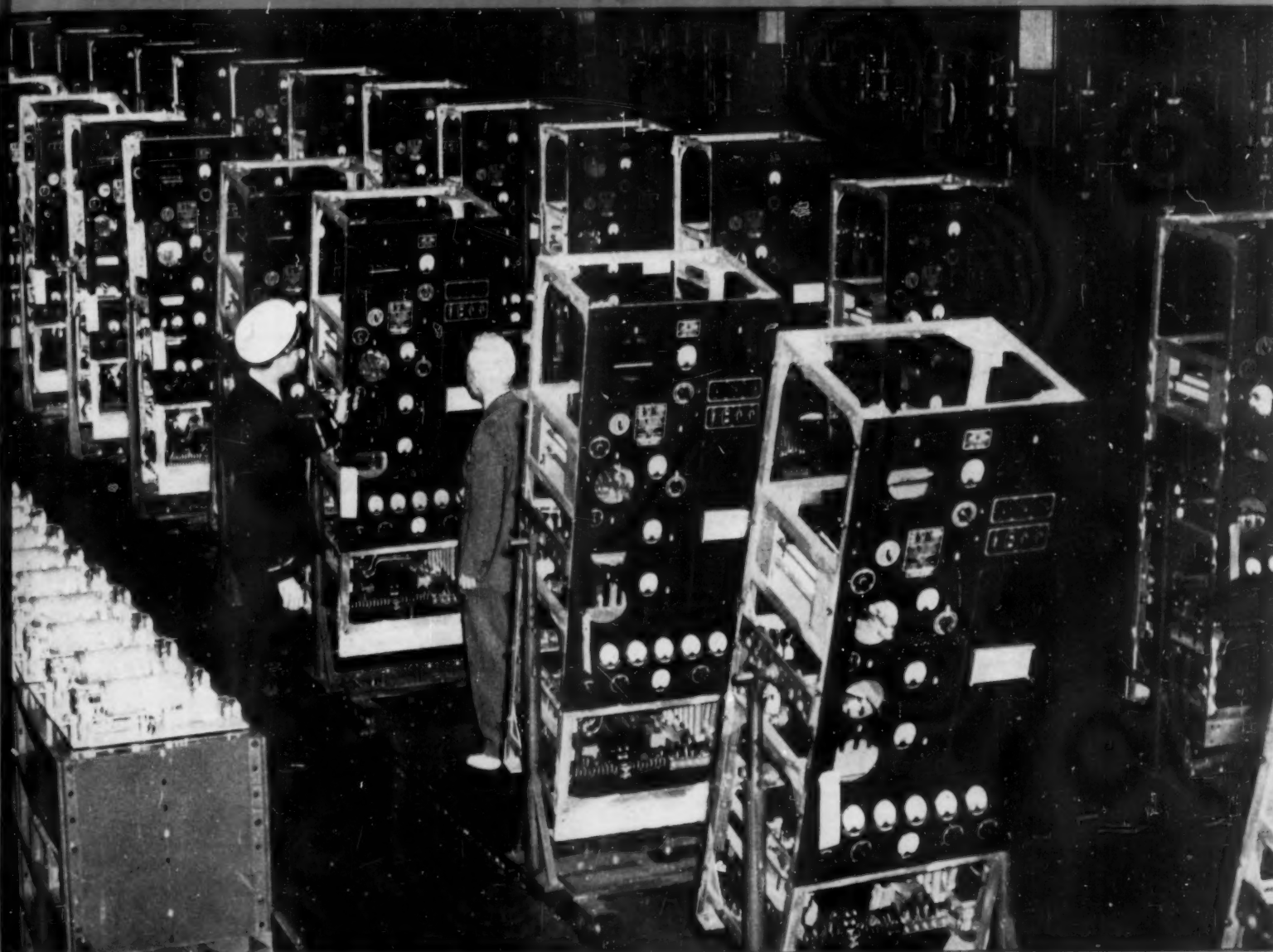
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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JANUARY 16, 1943



Radio for War

See Page 39

A SCIENCE SERVICE PUBLICATION

## Do You Know?

The *peanut* gives the highest oil yield of all the principal oil seeds.

The new *five-cent* piece contains 56% copper, 35% silver, and 9% manganese.

Cuba is considering mixing her imported *gasoline* with 25% domestic alcohol.

The United States has unlimited reserves of *mica* suitable for grinding into powder.

Many foods retain more nutritive value when *dehydrated* than when sun-dried or canned.

*Sugar substitutes* such as sorghum and molasses are actually more nutritious, being rich in iron and calcium.

Sunken Nazi U-boats make excellent *oyster beds*, according to recent findings of the Fish and Wildlife Service.

A quick method for freezing *beef*, taking six hours instead of eight days, has been developed in Argentina.

An Idaho mine, discovered in 1942 to contain *tungsten*, has already become the nation's largest tungsten producer.

*Eggs* should never be washed, since that destroys the "bloom" which prevents harmful bacteria from entering the eggshell.

Substitution of *glass* containers for metal cans in the paint industry will reduce its steel consumption from 73,000 tons to 6,700 tons.

## Question Box

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By the new scientific technique, how many thousand slices of meat are obtained from a one-inch specimen? p. 35.

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What plans are being made to improve the health of all the Americans? p. 42.

### WILDLIFE-AGRICULTURE

How do corn shocks standing in winter fields waste food? p. 46.

*Paper*, in laminated form cemented with plastic, is being widely used in Australian airplane manufacture.

*Black walnut* and butternut hulls, shunned even by squirrels, may some day be used commercially to produce fungicide.

*Burma* has less than eight miles of railroad per 1,000 square miles of territory, as compared to nearly 84 miles of railroad in the United States for every 1,000 square miles.

Women will probably make up about 30% of the *labor* force this year in war industries.

At least 75% of early active *tuberculosis* can be discovered only by X-ray examination.

Food sent to our allies is processed according to their special needs: for instance, Russia is now receiving tins of *cvinaya tushonka*, a pre-cooked, highly spiced pork product popular with the Red Army.

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## PHYSIOLOGY

# Muscle Sliced Super-Thin

Technique was developed, not in order to stretch the meat ration, but in order to learn more about what happens when muscle receives nerve signal to contract.

► DAD MAY be carving the Sunday roast in pretty thin slices these days to stretch the family meat ration, but scientists at the University of Pennsylvania have found a way of carving muscle meat so thin that more than 100,000 slices would have to be piled on top of each other to make a piece about one inch thick.

The method for cutting the 100,000-per-inch slices of muscle was developed by Dr. A. Glenn Richards, Jr., of the University's zoological laboratory; Dr. Thomas F. Anderson, RCA fellow of the National Research Council; and Dr. Robert T. Hance, of Duquesne University, Pittsburgh.

The super-thin scientific slicing technic was developed not in order to stretch the meat ration but in order to learn more details of what happens inside your muscles when, for example, you stretch your arms. Muscles, like every other part of the body, are made up of tiny cells. These cells can be seen under ordinary microscopes with light illuminating the slide on which lies a sliver of muscle about as thin as a fine hair. The size and shape of the cells can be seen, their nuclei, and minute fibrils and cross bands, but not much more. Scientists would like to see, for example, just what happens inside one of these muscle cells when a message flashed along a nerve orders the muscle to contract. Such knowledge might lead to better methods for treating infantile paralysis, myasthenia gravis and other nerve-muscle diseases.

The electron microscope, which uses an electron stream instead of light and focuses with magnets instead of glass lenses, has already pushed back the barriers of man's limited vision to the point where many objects hitherto invisible can be seen. The influenza virus, for example, so small that it long defied man to see it, much less to conquer it, has been brought within the range of visibility. So Drs. Richards, Anderson and Hance decided this instrument might be used to pierce the many remaining secrets of our body cells, shedding light not only on the cells but the

structures within their nuclei, such as the heredity-bearing chromosomes—perhaps even the genes themselves. Cell division seen under the electron microscope might yield important clues for solution of the cancer problem.

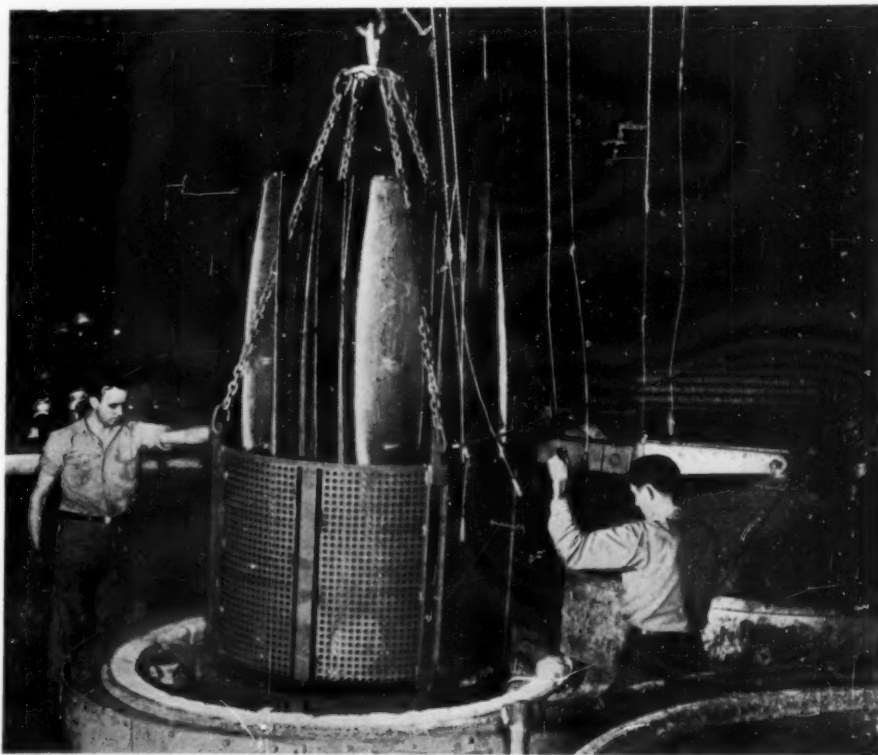
First, however, a method had to be developed for making slices of muscle or other tissue thin enough so that the electrons can penetrate it and make it visible. Details of the method are reported to fellow scientists in the Proceedings of the Society for Experimental Biology and Medicine.

The muscle is hardened in alcohol, formaldehyde and glacial acetic acid. After this it is washed in distilled water and then embedded in a special kind of

wax, called "Carbo-Wax 4000." Then it is ready for cutting into slices so thin they are literally invisible. The scientists had to use a light microscope to see and handle them for mounting under the electron microscope. A new machine had to be designed and built to cut such thin slices. The hygroscopic property of the special wax used, its extreme hardness, and its ready removal with water are its advantages for this work.

Development of this technic was hailed as an outstanding achievement in a report by Dr. Stuart Mudd at a recent demonstration of the RCA electron microscope.

"Sections sufficiently thin for examination in the electron microscope have been prepared. However, certain technical difficulties remain to be overcome. If and when these further difficulties have been solved the whole field of histology and cytology can profitably be resurveyed with the electron microscope; this may well yield useful new information for a hundred years to come," he said. (Turn to next page)



**FOR COOKING**—In the top basket, like so many potato chips are aluminum airplane propeller blades, being lowered into a heat treating pit furnace. The bottom basket contains small forged parts—all for warplanes. The work is being done at the Aluminum Company of America, whose production of forgings is reported to be 25 times that of 1938.



The first bit of tissue studied with the new technic was muscle, but not a kind used for food even in these days of meat

rationing. It was a body muscle of the American cockroach.

*Science News Letter, January 16, 1943*

lergy who have been freed from allergic symptoms through appropriate diet are no longer susceptible to colds.

*Science News Letter, January 16, 1943*

# MEDICINE

## New Food Allergy Tests

Discovery promises to point to specific dietary means for relieving troubles ranging from migraine, indigestion and epilepsy to common colds.

► **DISCOVERY** of a new test for food allergy which promises to show specific dietary means for relieving a large part of the population from troubles ranging from migraine, indigestion and epilepsy to susceptibility to common colds was announced by Dr. Arthur F. Coca, of Oradell, N. J., at the Fifth Annual Forum on Allergy in Cleveland. Dr. Coca received the Forum's gold medal "for outstanding contribution to clinical allergy."

By means of the new, highly accurate test for food allergy, Dr. Coca stated, he is able to define a new category including migraine, indigestion, constipation, sinusitis, dizziness, tiredness, nervousness, epilepsy, high blood pressure, and a number of other symptoms.

The well-known skin tests for allergy are useless in this group, which probably

includes over 80% of the population, Dr. Coca said.

About two-thirds of the sufferers from food allergy can be wholly freed of the listed symptoms by mere avoidance of the foods identified by the new test, in which the culprit food is shown by a specific speed-up of the pulse rate.

In a small series of cases in collaboration with Major Laurence Miscall, M. C., U. S. Army, the Crile operation of sympathectomy, a nerve-cutting operation, was found highly effective in the control of the listed food allergic symptoms.

Food allergy, Dr. Coca has previously reported, is the most important predisposing cause of common colds. This has been confirmed, he said, by Dr. Arthur Locke, of Western Pennsylvania Hospital, Pittsburgh, in a large scale study at Stevens College. Subjects of food al-

# MEDICINE

## Same Defense Mechanism Causes Very Different Ills

► **TYPHOID FEVER**, syphilis, hay fever and a wide variety of other equally different illnesses are produced by the same reaction of the body against invasion, Dr. Milton B. Cohen, of Cleveland, declared at the Fifth Annual Forum on Allergy.

This is a standard method the body has for dealing with foreign substances which enter it, Dr. Cohen explained. He gave it the scientific term of the "dynamic mechanism of allergic reaction."

"During life," Dr. Cohen pointed out, "the body is always changing. Myriads of chemical processes go on quietly and unnoticed."

When the body is attacked by the entrance of bacteria, pollens or serum, which scientists call antigens, no visible change occurs for several days. The body is building a defense during this period by making substances called antibodies. These neutralize or destroy the antigen which entered.

When these antibodies unite with the antigen, Dr. Cohen explained, a poisonous substance is formed. It is this substance which produces the illness. The disease is therefore the result of the body's defense against a foreign substance.

"When the body reacts in this way it is said to be allergic," Dr. Cohen said. "Allergic reactions to non-living substances, such as pollens, dust and sera, produce a common poisonous substance and the same type of illness."

"Allergic reactions to bacteria, however, produce individual types of poisonous substances and different types of illness, depending on the nature of the bacteria."

*Science News Letter, January 16, 1943*

**Thermite**, for incendiary bombs, is a mixture of aluminum powder and iron oxide which burns with tremendous heat because of the affinity of the aluminum for the oxygen.

Several hundred acres a week in Panama and Costa Rica are now being cut from jungle and seeded to manila fiber plants, to help supply enough rope for United Nations' war needs.



**MOSQUITO WING**—This is the flying apparatus of the summer pest, photographed by Vincent J. Schaefer, of the General Electric Research Laboratory. His original photograph showed the wing magnified 100 times. The fine fringe along the edge is shown at much greater magnification in the picture on the facing page.

## ENGINEERING

# Salvage Brass-Clad Steel

Common solvent, cupric ammonium carbonate, is used to remove the copper and zinc, leaving the steel to be reprocessed. Copper and zinc then freed by smelting.

► UNSCRAMBLING the proverbial omelet is a simple problem compared with the task of separating copper, zinc and steel that are all mixed together in the scrap resulting from bullet-making operations in American munitions plants. The difficulty is a new one, caused by the decision of the Army's Ordnance Department to change over from bullet jackets made entirely of soft brass to brass-clad steel jackets.

A modern bullet is a relatively complex affair. Instead of the simple, solid leaden slug used in our older wars, high-velocity rifles like the Garand and the Springfield demand a bullet with a hard jacket, filled with a lead-antimony alloy to give it weight and balance. A copper-zinc alloy that amounts to a soft brass (technically, "gilding metal") has been used. Scrap from jacket-making operations with this metal can simply be melted down and re-used.

But for economy's sake, it was decided to use a steel jacket coated with only about 20% of its weight in the

gilding-metal alloy. In the scrap, the steel is still firmly stuck to the alloy, and it becomes a chemical job to separate them. It is decidedly worth doing, for the scrap production is now estimated at nearly 20,000 tons a month.

The problem was met by the use of a common solvent, cupric ammonium carbonate, already used by some copper producers on ore and commercial scrap. It removes the copper as oxide, the zinc also (though not quite so successfully), leaving the steel to be melted down and reprocessed. The copper and zinc can, of course, be freed as metals from their respective oxides by modifications of standard smelting processes.

The cupric ammonium carbonate solution process was recommended by the Metallurgy Committee of the National Academy of Sciences after investigation of this and several other methods. The project was undertaken at the request of the War Production Board.

*Science News Letter, January 16, 1943*



**ELECTRON MICROGRAPH** of a few of the feathers on the edge of a mosquito's wing. The picture from which this illustration was reproduced was made with the General Electric portable electron microscope, and showed the details in the structure of these tiny parts magnified 5,000 times. The magnification is not quite so great in this reproduction, but the details shown here are not visible in the most powerful of light microscopes. See light microscope photograph on facing page.

## ENGINEERING

# Gas Mains Repaired

► SPEEDIER repair of shattered low-pressure gas mains after bombing or other disasters has been developed by wartime engineering. Plastic fillings, rubber bubbles and butterfly valves are some of the unusual devices described by G. S. Goldsmith, engineer of distribution for the Brooklyn Union Gas Company, Brooklyn, (*Chemical and Metallurgical Engineering*, December).

Filling the broken main with plastic material, such as wax, stops gas flow from a six-inch pipe within five minutes after the emergency crew arrives.

The idea originated at the Philadelphia Gas Works Company during an emergency. Why not disconnect a customer's meter and pump something like heavy grease out through the lead-in pipe to plug up the broken main? It worked so well that other experimenters picked it up; improved on it for war use.

The butterfly control valve is a glorified stovepipe damper developed by the San Diego Gas and Electric Company. The disk, faced with discarded garden hose or similar sealing material, is inserted through a slot cut in the top of the gas main. Operation is controlled by a rod sticking up to the street surface.

When ends of the shattered main are not covered by debris, Mr. Goldsmith believes that conical plugs are the most practical device. A flexible joint connects the plug to a long sectional pole for insertion. Thus the operator can avoid the issuing gas or shooting flames.

Rubber bubbles are preferred for blocking off mains of large diameter. This method is used in peacetime by digging up the gas main, drilling a hole in the pipe, inserting the rubber bag, then inflating it with air.

With a large section blown away and

the gas ignited, as occurs under war conditions, there is no time for such procedure. Standpipes installed every three or four blocks would permit insertion of the rubber bubbles at a moment's notice. But they are expensive. Now methods have been developed by Mr. Goldsmith and his associates to reduce cost. Their machine will drill and tap a hole in a gas main three feet underground in one operation.

*Science News Letter, January 16, 1943*

## ● RADIO

Saturday, January 23, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Ivor Griffith, Dean of the Philadelphia College of Pharmacy and Science, will discuss "Synthetic Substitutes for Drugs."

Monday, January 18, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Longer Lives" will be the subject of the program.

## NUTRITION

# Won't Starve Until Fall

U. S. Public Health Officer tells of health conditions in Germany. Physicians scarce as well as rations. Morale surprisingly high.

By HOWARD D. FISHBURN,  
M.D.

Passed Assistant Surgeon, U. S. Public Health Service.

*(From September, 1938, till December 11, 1941, Dr. Fishburn was assigned to the U. S. Embassy in Berlin, his duties involving considerable travel in Germany and Europe generally. The following is an account of what he saw of medical and health conditions then and personal experience on the German civilian diet during his internment at Bad Nauheim with the American Embassy group.)*

➤ STARVATION was a potent factor in Germany's collapse in 1918, and there has been much speculation in this country as to whether the German economy today is comparable to that of World War I. Before I left Germany in June 1942, I was told by a well known Swiss economist and writer that he considered Germany's situation in October 1941, similar to that in 1916—two years before the collapse.

On the basis of this experience, Germany might expect to keep her civilian population above the starvation level until the autumn of 1943. This opinion was also held by informed Germans who had not been hypnotized by the propaganda machine.

## Ration Plan Was Ready

A food rationing system scientifically devised was ready to be placed in operation the day war was declared in 1939. A standard ration was provided, with special consideration and extra allotments for workers in heavy industry, children, and pregnant women. After September 1939, the ration—considered adequate at the beginning—was reduced periodically until, at the time I left Germany, it was definitely inadequate for continued maintenance of health. The weekly ration allotted to the average German was about 11 ounces of meat including the bone (which really meant 7 ounces of edible meat); 7 ounces of fats; 4½ lbs of bread; a little over one

ounce of cheese. Vegetables were not rationed, but they were not available at all times. Fruit and milk were reserved for children and expectant mothers. Coffee, tea, chocolate, and spices were not obtainable.

Beer was available in small quantities, but usually it was served only in the evenings, from eight to ten o'clock. The quality of the beer had been reduced greatly, nevertheless the people readily consumed all available supplies. Other liquors were practically nonexistent for public consumption.

Although the German authorities have tried to assure the people that their wartime diet is adequate, there has been a steady and gradual loss of weight and of the sense of well-being among the entire population, especially among the aged and infirm.

## Can't Explain Morale

Since I existed on this diet for six months, I can state that I am at a loss to explain the apparent efficiency of the German workers and the high level of public morale at the time I left the country. No doubt the workers were less efficient and the state of morale not so high as before the war; but it was surprising to foreign observers that German morale had not suffered seriously — if for no other reason than the food shortage.

The 100 young healthy adult males, who were interned with me from December 14, 1941 to May 17, 1942, received slightly better than German rations and most of them performed absolutely no physical labor. In spite of this, they were hungry all the time and their weight-loss varied from 5 to 36 pounds, with an average loss of 10 pounds for the group. It is logical to assume that this average loss of weight would have been greater had the men been less healthy at the outset or had they been performing physical labor. There were no conditions noted in this group that could be called a definite vitamin deficiency although it was felt that certain cases were approaching this condition.

The German people, then, were not

adequately fed but they were not starving. Such was the status of nutrition in Germany as of May 17, 1942. There was every indication that the situation was much worse in all the occupied countries, with the exception of Denmark. Since Europe has never been able to feed herself without imports, the "expected course" is one of rations becoming shorter and shorter.

Since my duties while assigned to the U. S. Embassy in Berlin involved considerable travel in Europe and especially Germany, I was able to see more of Germany's medical and health problems than the casual observer or one less interested in medical subjects.

Germany has a highly organized system of medicine with the closest integration of local and national agencies. Many advanced ideas have been translated into law, especially in the fields of preventive medicine, hygiene, sickness insurance and genetics. For example, the laws provide free treatment of venereal disease cases, isolation of all active cases of pulmonary tuberculosis, compulsory sickness insurance of all workers earning \$1,200 a year or less, and sterilization of all persons suffering from organic mental diseases.

In recent years, the anti-semitic movement and the war have interfered with the smooth functioning of the German medical organization. Before the Nazis came to power, there were a good many Jews in the medical profession in Germany. With the rise of the Nazis, the anti-semitic program, which reached its height in 1938, soon caused a shortage of doctors because of restrictions placed on Jewish physicians and because of their exodus from Germany.

## Shortage of Physicians

The war which followed in 1939 greatly intensified this shortage in medical personnel, with the result that the standard of medical care fell sharply, especially the care given to the insured population. The few remaining overworked doctors in private practice naturally attempted to care for the critically ill first, persons in higher income groups second, and the insured lower income groups last. I was told by a heart specialist in one of the "Cure Resorts" so popular in Europe that a high percentage of his patients were doctors, indicating that men left in civilian practice were "cracking up" under the strain.

To overcome this shortage in medical personnel, various stratagems have been adopted.



The course in medical education has been shortened by about a year and a half. Enrollment has been increased in the medical schools by running two shifts. Much of the time gained by shortening the medical course has been at the expense of vacation periods, therefore the curriculum has not been curtailed to the extent that the shortened period of training would indicate. However, such subjects as "The Theory of Race Superiority" continued to hold an important place in the medical curriculum at the expense of essential subjects.

### Cultists May Practice

Groups comparable to our medical "cultists," who formerly were not recognized as trained in the science of medicine, have been allowed to practice. They have been recognized by the government as medical practitioners with rights similar to the rights of regular physicians. Unquestionably, this practice has lowered medical standards, although not to the extent one might have expected, since medical "cultists," never have been strong in Germany.

Many physicians, who had been made reserve officers in the German army, had been placed on active duty to care for army cases in local hospitals, but were permitted to continue their civilian practice on the side.

Compared with our American hospitals, German institutions even before the war seemed poorly equipped and poorly staffed as regards sub-professional personnel. The return of sick and wounded men from Russia and North Africa threw a tremendous burden upon the hospitals. As a result of the bed shortage, the sanatoria and chronic disease hospitals have been emptied of their tuberculosis and cancer patients and their nonviolent psychotics. These evacuated patients have been dumped back into the civilian communities and required to work in the war industries, if able to perform any worthwhile work.

A great number of hotels and other similar structures easily adapted to the care of the sick have been taken over by the German government and converted into hospitals and convalescent homes. Buildings chosen for conversion have been located, preferably, in areas away from the war industries and where there would be less danger from air raids.

The epidemics which usually accompany war, and which have been expected in Germany, had not made their appearance up to May 1942. During the early months of the war, when air raid shelters



**NAVY GOGGLES**—Polarizing lenses filter out reflected glare and sunburn rays to conserve and sharpen the eyesight of American sailors. A control button rotates the lenses to adjust the amount of light admitted as shown in the photograph.

were poorly heated and poorly equipped, an increase in respiratory diseases was noted. After the Russian campaign was well under way, scattered cases of typhus fever among prisoners and soldiers on leave from the front caused concern, but typhus had not reached epidemic proportions when I left Germany.

Little could be learned about reserve supplies of essential medical and surgical materials for the German armed forces, but the supply available to civilian practice had passed the stage of scarcity and reached the stage of inadequacy. Such imported items as iodine, quinine, castor oil, and petroleum products, available only in limited quantities before the war, were shortly thereafter nonexistent in civilian practice. Ointments were being compounded with a non-fatty base and, on the whole, had little clinical value. There was a scarcity of practically every drug in common use, and these drugs—especially the narcotics, sedatives, and cathartics—were available only in small quantities.

Most surgical dressings consisted of a cellulose material resembling our well-known "facial tissues," with one layer of gauze as an outside covering to hold the bandage in place. Cotton was very scarce and adhesive tape was being fabricated of paper. A limited supply of sur-

gical instruments was obtainable in large cities, but their manufacture was discontinued, except for items in everyday use, such as hypodermic syringes. The quality and workmanship of these were very poor. As a result, German pharmacists were apologetic for their inability to supply a doctor, but rather than admit a shortage of products, they placed all the blame on the transport system.

*Science News Letter, January 16, 1943*

### RADIO

## Radio Transmitters Help To Fight the War at Sea

See Front Cover

► ON THE COVER of this week's SCIENCE NEWS LETTER are shown long rows of radio transmitters for the Navy.

Many ships have not one but a number of transmitters and receivers of various frequencies and power as well as portable radio equipment and also equipment for detecting ships and planes. These are being built by the General Electric Company.

*Science News Letter, January 16, 1943*

The United States normally uses 500 billion matches a year, consuming 500 tons of steel for book-match staples alone.

## PHYSIOLOGY

**Horses Rest Better When Standing Up, Tests Show**

► HORSES rest better on their four feet than they do lying on their sides. It has long been known that they do much of their sleeping standing up, but it has remained for a member of the University of Missouri faculty, C. F. Winchester of the animal husbandry department, to demonstrate by actual measurement that they use up fewer calories in that position than they do lying down.

Mr. Winchester used two ponies, one a three-year-old filly and the other a four-year-old mare, which had been trained to lie down at command, and which also would wear without protest the head-masks required for basal metabolism tests in animals. He found that standing had a definite advantage over the lying position both in breathing rate and in economy of oxygen use.

The experiments are reported in *Science* (Jan. 1).

*Science News Letter, January 16, 1943*

## PUBLIC HEALTH

**Overweight Unpatriotic As Well as Unhealthy**

► TO BE OVERWEIGHT in these days when every ounce of food must be used wisely is unpatriotic as well as unhealthy and unesthetic, health authorities of the Metropolitan Life Insurance Company charge in their *Statistical Bulletin*.

Currently used tables of average weights for women are criticized for showing increases with advancing age which are neither necessary nor desirable. A large scale study by the company has "definitely shown that at the young adult ages a moderate degree of overweight was beneficial, but that beginning at about age 35, the advantage lay with women of average weight. In middle age and beyond, the underweights had the best longevity record. Frank obesity was bad at every age."

The current tables allow 13 to 14 pounds increase in weight for short women between the ages of 30 and 50, and 15 pounds or more increase for tall women at these ages. These increases, the life insurance company charges, reflect the effect of continuing to eat the same amount of food while physical activity decreases.

They propose a new set of "ideal" weight tables for women over 25 which take into account differences in body

build and height. According to these tables, women over 25 years of small frame and a height of five feet five inches, with shoes, should weigh between 119 and 128 pounds in ordinary clothing. Women of this same height of medium frame should weigh between 127 and 135 pounds. Large-framed women of the same height should weigh from 133 to 145 pounds.

*Science News Letter, January 16, 1943*

## MEDICINE

**Plasma from Large Banks Safe for Transfusion**

► THE USE of blood plasma from large pools or banks of all four blood types for patients of any blood type is vindicated in a report by Dr. William Thalhimier, of the Public Research Institute of the City of New York, Inc. (*Journal, American Medical Association*, Dec. 19).

Several recent reports have pointed to possible danger to patients from injection of plasma from a bank, on the ground that such plasma might contain substances incompatible with the patient's blood. In transfusions of whole blood from a single donor to a patient, both patient's and donor's blood of course must be compatible. Even after careful tests for compatibility, Dr. Thalhimier points out, reactions after such transfusions do occur and apparently cannot be reduced to fewer than three reactions per 100 transfusions.

In the case of transfusions of plasma from a blood plasma bank, however, medical scientists have generally been of the opinion that the substance in one donor's blood which might cause trouble for one patient are so diluted when mixed in the bank or pool with plasma from many donors that no one patient would get enough of the incompatible substance to cause serious harm.

Dr. Thalhimier reviewed reports of English and American investigations of this point, of experience with blood plasma banks, and made tests of his own. He concludes that "in pools (banks) of a sufficient number of samples of plasma or serum obtained from donors belonging to all four blood groups the titer of both anti A and anti B agglutinins (substances which might cause reactions) is reduced to such a low level that no danger can result to patients from the injection intravenously (into a vein) of even large therapeutic doses of these pools."

*Science News Letter, January 16, 1943*

**IN SCIENCE**

## INVENTION

**Oil Density Measured From Outside the Pipe**

► MEASURING the specific gravity or density of oil or other fluids inside a pipe without making a hole in the pipe is the feat accomplished by a method patented (No. 2,304,910) by Donald G. C. Hare, Houston, Texas. It isn't as magical as it sounds. All that is necessary is to place near the pipe a source of highly penetrating radiation, gamma rays for example, that can penetrate the metal wall. Within the pipe the radiations are intercepted and partly scattered by the oil or other contents, some of them passing back out. Here they are picked up by a suitable instrument for measuring their intensity. From known scattering effects of oil at various densities and temperatures, previously determined by experiment and calculation, the readings can be translated in terms of conditions within the pipe.

*Science News Letter, January 16, 1943*

## AERONAUTICS

**Flying Fortress Designer Given Sperry Award**

► THE LAWRENCE SPERRY Award for 1942, given in recognition for high achievement in aeronautical science, has been voted to 32-year-old Edward C. Wells of the Boeing Aircraft Company, by a committee headed by Maj. Gen. James H. Doolittle. Mr. Wells has devoted practically all his efforts to the improvement of the four-engined Flying Fortress, and is credited by his colleagues with many of the advances that have made the big plane into the formidable instrument of battle that it is.

The Sperry Award was founded in memory of the late Lawrence Sperry, pioneer aviator and inventor, who was drowned at the age of 31 as the result of a forced landing in the English channel. The honor, which is intended primarily for young men in the field of aeronautical science, is accompanied by a cash gift of \$250.

*Science News Letter, January 16, 1943*



# THE FIELDS

## METEOROLOGY

### Winter Floods on Ohio Follow Weather Pattern

► WINTER FLOODS in the Ohio valley, annual dangers that sometimes build up into disasters, always follow the same general pattern in antecedent weather setups, meteorologists of the U. S. Weather Bureau state. A warm, moist mass of air moves up from over the Gulf of Mexico, strikes a cold air mass somewhere over the upper Ohio region, and gets the water wrung out of it onto steep-sided hills that pour it down into the tributary streams in their V-shaped valleys like so many roofs with brimming gutterspouts. If there happens to be snow on the ground, that gets washed down, too, and adds to the engorged rivers' burden.

The flood may be only a flash affair, if the rainstorm engendered by the clash of warm southern and cold northern air masses over the Monongahela and Alleghany watersheds is a rapidly moving one. If the situation stagnates, the clouds may hang for several days, persistently pouring out their contents. Then the situation may become very bad, like the flood that drowned out Pittsburgh in 1936 and the even greater one that was a major disaster along the middle and lower Ohio course in 1937.

*Science News Letter, January 16, 1943*

## PSYCHOLOGY

### Radio Soap Operas Can Be War Information Source

► SOAP OPERA should go to war, according to Dr. Paul Lazarsfeld, Director of the Office of Radio Research at Columbia University. These daytime radio serials beloved by some 20,000,000, or nearly half of all American women, can and should mobilize for war education, he says.

Although they deal with many real-life problems of the average middle-class listener, the serials do not go far enough in helping people to understand our present society or world problems, says Dr. Lazarsfeld.

About 40% of the women listeners

say that the soap opera helps them solve their own problems, according to studies made by the Office of Radio Research. One woman had become reconciled to her son going off to the war; another felt she understood her husband better; another was inspired by the example of a middle-aged heroine in meeting old age gracefully.

But since the problems confronted by radio characters are always too personalized (disasters are the result of personal villains, not social forces), Dr. Lazarsfeld feels the war is in danger of being presented merely as a backdrop to the plot, not an integral part of the story. He commends two experimental series put out by OWI and believes that the daytime serial can and should be used for war education.

It is easy to experiment with new types of program, he says, because 80% of the women who listen to one serial also listen to the next one on the same station. A new serial, sandwiched in between old favorites, could catch on and become popular, says Dr. Lazarsfeld.

*Science News Letter, January 16, 1943*

## METEOROLOGY

### Average U. S. A. Snowfall Is Twenty-Eight Inches

► SNOWFALL for the United States as a whole averages 28 inches per winter, meteorologists of the U. S. Weather Bureau have determined. Curiously enough, 28 inches also represents the average total precipitation, in which rain and snow are lumped together. Since an inch of snow melts down to form a tenth of an inch of water, this means that on the whole one-tenth of the country's water supply falls in the form of snow.

In this reckoning, Florida and California are purposely omitted; Florida because the few flakes of snow that fall there in "exceptional" years don't count, California because of extreme variability in conditions, from no snow at all along the southern coast to many feet in the high Sierra.

The thickest mantle of snow ever recorded for one spot in the United States was 884 inches (more than 73 feet) measured at Tamarack, Calif., in the winter of 1906-07.

Other notable snowfalls include 60 inches at Giant Forest, Calif., in one day; 42 inches at Angola, N. Y., in two days; 54 inches at The Dalles, Ore., in three days, and 96 inches at Vanceboro, Maine, in four days.

*Science News Letter, January 16, 1943*

## PHARMACY

### Parkinson's Disease Helped By Drug from Coral Tree

► RELIEF of muscular rigidity or spasm and cramps in patients suffering with Parkinson's disease or other spastic conditions can be achieved with a drug from a home-grown plant, the coral tree, Dr. Richard W. Harvey, of the University of California Medical School, has found.

The coral tree, a native of the tropics which has become a garden shrub in Florida and California, thus provides a substitute for curare, South American arrow poison which is more difficult to obtain. The drug from the coral tree is scientifically known as erythroidine.

No ill effects from the drug have been noted, Dr. Harvey declared, and any symptoms of overdosage can easily be overcome by administering prostigmin, an erythroidine antagonist.

"Patients state they feel a little less stiff, or the cramps are relieved," he reported. "While the effects are largely subjective, our experience with erythroidine in spastic conditions is so encouraging that we plan to use this drug in the treatment of spastics as they present themselves."

*Science News Letter, January 16, 1943*

## PHYSICS

### Amber-Colored Diamonds Changed to Green

► BEAUTY CHANGES in colored diamonds seem to be only skin deep, experiments by Prof. J. M. Cork of the University of Michigan indicate (*Physical Review*, Nov. 1 and 15).

Prof. Cork had discovered that amber-colored diamonds turned green upon being bombarded with high-velocity streams of deuterium (double-weight hydrogen) atoms. He then subjected two virtually identical stones to the bombardment, but protected all but one face of one of them with wax, which the deuterons could not penetrate. This surface was placed in contact with the corresponding surface of the other stone.

Despite the close contact of the two diamonds, only the unwaxed one turned green; the protected one remained unchanged. For this reason, Prof. Cork concludes: "This indicates that the alteration in color probably is produced only as deep as the penetration of the energetic deuterons."

*Science News Letter, January 16, 1943*

PUBLIC HEALTH

# Pan-American Health

The United States has joined all our neighbors to the south in the greatest program of health ever attempted to increase all-American strength.

By GLENN SONNEDECKER

► AMERICANS hacking through Amazon jungles today carry weapons of science and sanitation. Planes drop health supplies instead of lethal bombs from South American skies.

Uncle Sam has grasped the hand of our powerful neighbor. But tropical diseases and growing pains demand the greatest inter-American health and sanitation program ever attempted, to bolster her strength. An all-out project is now being pushed by the Office of Inter-American Affairs in Washington in collaboration with authorities in the other Americas.

With efficiency of workers thus protected, South America can throw millions of tons of vital materials into the war effort. Rubber, quinine, vegetable oils and metals—all formerly obtained from

Jap-held territory — could be produced entirely or in part. Most Far Eastern plants, such as important drugs and manila hemp, can be grown in South America; they will be grown there, many authorities believe, even after the war.

Fifteen rubber-producing Americas have signed up to sell the United States their exportable rubber surplus. And we cannot minimize its value. Despite the synthetic program, natural rubber is irreplaceable for some uses. Relatively small amounts, such as we shall obtain from this hemisphere, will increase efficiency and go a long way when mixed with the man-made product.

Health projects are tied closely to rubber production. United States specialists and technicians are the advance guard, preparing the way for thousands of additional tappers who collect rubber for the United States market.

Aerial attacks from mosquitoes can be as deadly to these men as bombs and bullets are to those fighting on other fronts. Here malaria kills thousands. Control includes elimination of swamps and other mosquito-breeding places; dwellings are mosquito-proofed; drugs are distributed. Millions of atabrine tablets, the new anti-malarial, have been flown to rubber-producing areas. More are on the way.

A hospital is being built at Tingo Maria, Peru. Others are proposed for strategic producing areas there.

"Most of the projects which have been started or projected should yield the American republics substantial benefits, both for the war period and for the post-war years," declares Gen. George C. Dunham, physician directing the inter-American health and sanitation program.

## Battle Malaria

Deep in the mysterious, rich, undeveloped Amazon valley, some 2,000 miles up the great river, a typical project has been started at Guayaquil, Bolivia. Rubber collected in the hot, humid forest, passes through this port on its devious journey to a distant battlefield. Malaria raged through the town. The campaign conducted by Dr. E. H. Payne and his associates against malaria here, is only a skirmish in the main war on disease in the Western Hemisphere rubber areas. But it is typical of the part being played by American health authorities in the United Nations strategy of supply.

Dr. Payne saw a desperate need for hospital facilities. Construction material from the jungle itself was lugged by foot and mule to a native sawmill. Planes packed with medical supplies answered his urgent call to the United States. A patrol of mosquito fighters was trained; chemical warfare shot oil into mosquito breeding places, larvae were dusted with Paris green. Eliminating nearby swamps, improving the water supply and sanitation facilities are the problems now being attacked by Dr. Payne, according to the last report from this distant outpost of war workers.

Besides malaria, authorities must combat other hazards of the tropics—yellow fever, amoebic dysentery, snake and scorpion bites, and attacks by animals.

Rubber tappers sloshing through



**HEALTH IMPORTANT**—These workers are constructing a road to the site of a 300-bed hospital to be built in Guayaquil, Ecuador. The all-American health program will make workers strong for war.

jungle streams are warned by medical men to avoid the dangerous sting rays, electrical eels and the piranhas or cannibal fish. Heavily booted men show wary respect to blind worms, ants, hairy larvae and spiney plants.

Medical treatment of the odd mishaps which befall men developing South American resources, is handicapped by difficulty of obtaining and transporting supplies.

Most drugs were formerly supplied by Germany. With imports cut off, South Americans are increasingly dependent on United States drug manufacturers. Increased plant capacity has been developed in many countries, augmented by large shipments from U. S. laboratories.

Brazil and Mexico have taken over the assets of German pharmaceutical laboratories, and Nicaragua seized German drug stocks. In some countries prescription drugs obtained from the Nazis are still being sold, but American firms are also gradually taking over this trade.

Drugs and health workers are transported into the Amazon country by river boats. At six strategic centers along the way, hospitals are planned. Laboratories operate in the shipping centers of Belem and Manaus, for examination of mosquito larvae.

Plans for 50 to 100 clinics to treat the sick and to give advice in disease prevention and diet are also announced by

the Coordinator of Inter-American Affairs.

The program includes mining regions which supply United Nations war industry. Gold was the yellow lure for early explorers of our neighbor republics; now interest centers on less glamorous metals like lead, and manganese.

Biggest copper producing mine in the world is gouged into the Andes mountains 10,000 feet up.

Other mines have been developed into major supply sources of essential copper with the aid of United States technical skill and machinery. War demands have pushed output to a new high, including large-scale mining of low-grade ores. Accounts of this new development say that an American engineer, William Braden, used 2,500 oxen to drag the machinery up the Andes heights.

The Chilean Andes also yield quantities of nitrates, now going principally to United States industry for making explosives and other war products.

A great core of other undeveloped resources is veneered with modern civilization. For most South Americans still live within a hundred miles or so of the coast.

But American technology is supplying them with tools and medical science is making them strong. Thus a great continent stirs under the impetus of war.

*Science News Letter, January 16, 1943*



## PARFOCAL WITHIN

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### PUBLIC HEALTH

## Vaccination Stops Smallpox

► THE SMALLPOX outbreak in Pennsylvania is nothing to get panicky about. It does, however, serve as a reminder of the importance of having oneself and one's family vaccinated, because successful vaccination gives protection against smallpox. That is the opinion of health authorities in Washington.

Latest reports to the U. S. Public Health Service show 52 smallpox cases in Pennsylvania and a total of 17 cases for the rest of the nation. The latter were scattered over five different states.

The Pennsylvania cases were in a community isolated by both geography and custom from other communities. The cases were mild. Vaccination was given promptly to thousands who, in the opinion of Pennsylvania state and city health officers might be in danger of getting the disease. Pennsylvania is one of the states requiring vaccination for school atten-

dance, so that much of the population has already been protected against smallpox. All these facts have kept health authorities generally from being unduly alarmed over the situation.

In some states and cities, health officers are urging all people to be vaccinated or revaccinated. This is thought to be a wise move, particularly in communities where vaccination has not previously been general and where there has been a large influx of possibly unvaccinated war workers from other parts of the country.

Vaccination or revaccination is also advised for persons who daily come in contact with people from all over the country, for example those working in large railroad stations and hotels.

The question of how far this smallpox outbreak will spread can be answered as follows: It will not spread to persons



who have been successfully vaccinated against smallpox. Unvaccinated persons who have come in contact with smallpox patients are in danger of getting the disease, because everyone is susceptible to it unless he has had an attack or been vaccinated.

Most people think of smallpox as a skin disease, but actually it starts and spreads like influenza. The disease is caused by a virus which invades the body through the nose and throat and during the first two days, before the skin rash appears, the patient has fever and a generally ill feeling suggesting an attack of gripe or 'flu.

The virus of the disease is spread through nose and throat discharges from the patient as well as through material from the skin spots after these appear. Crowding favors the spread of smallpox, as it does the spread of influenza or other diseases transmitted by nose and throat discharges. Unlike influenza, however, which develops very quickly, the incubation period for smallpox is eight or ten to 16 days, so that unprotected persons are not out of danger until at least 16 days following exposure to a smallpox patient.

Parents of the small children reported to have caught smallpox in the Pennsylvania outbreak evidently did not follow President Roosevelt's advice when, in proclaiming May Day as Child Health Day for 1942, he urged that all children over nine months of age be vaccinated against smallpox before the first of May, 1942. Doctors and health officers for years have urged that all babies be vaccinated against this dangerous, disfiguring disease before they are one year old.

A single vaccination in infancy, however, does not guarantee full protection against smallpox for life. The vaccination should be repeated on entering school and at intervals during later life.

*Science News Letter, January 16, 1943*

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#### NUTRITION

## Soy Flour Bread Tried

**Soybeans contain over three times as much protein as an equal weight of meat, and some of the shortening can possibly be left out when soy flour is used.**

► **SOY FLOUR** in bread may soon provide some of the protein lacking in meat-deficient diets. Part of the record-breaking soybean crop just harvested should be on American tables this year, some government experts believe.

Soybeans contain over three times as much bodybuilding protein as an equal weight of meat. Experiments have not yet indicated the exact comparative vitamin and mineral contents.

But rats living on a soy diet were still in top-notch health after seven generations. Nutrition was just as good as during similar tests on meat.

Present investigations will disclose just how Mrs. America will use this new food.

Soy flour has already been used to some extent by the Army.

Mixture of soy and wheat flours produces a well-flavored bread much improved in nutritional value. Some of the war-scarce shortening may be omitted when full fat soy flour is used, one report suggests. The baker can also use soy flour to replace dry skim milk, of which there is a shortage, at only a third the cost. Content of riboflavin and calcium is somewhat lowered by this procedure, however.

If soya were combined with enriched flour to make bread, the long-reputed staff of life would really be one of our most complete foods.

Impending milk shortages have fathomed the suggestion that soy milk also be adopted. It would be the best replacement available although not a complete substitute. Use in this country has been confined to babies who are allergic to ordinary milk.

Technical difficulties make it unlikely that soy milk will soon be generally available, government officials warn. New equipment and production specialists are needed. Keeping qualities must be improved.

Then the soy protein must be made into a milk-like suspension. But when treated to remove objectionable flavor, the milk emulsion breaks and protein settles out. Until such problems are solved, it's still a food of the future.

Soups, meats and breakfast foods containing soya, are only a few of the other products which may eventually be provided for both the doughboy and housewife.

*Science News Letter, January 16, 1943*

#### ENGINEERING

## About 3,000,000 Women Now in War Work

► **ABOUT** a fifth of the 14,000,000 employed women in the United States are now engaged in war work, and their numbers are expected to double by the end of this year, Mary Anderson, director of the Women's Bureau, U. S. Department of Labor, reported to the National Safety Council meeting in Chicago.

More women are now at work than ever before in our history, many of them "green" on the job and exposed to new accident dangers.

To safeguard their health and prevent lost time, authorities are experimenting with special clothes, safety gadgets and rest periods.

"Five or ten minutes away from the machine or the bench is not time lost," declared Miss Anderson. "It is more likely production units gained. Regular, brief rest periods are sound and simple safeguards against the fatigue which undermines efficiency and sets the stage for accidents."

Some tools are being made of lighter materials for women workers and do the job just as well. Other plant conditions are being adapted to the feminine touch.

War is revolutionizing the dress of millions of women. Ordinary street clothes are impractical on most jobs. The Women's Bureau has no rule-of-thumb standards, Miss Anderson explained, but encourages development of apparel adapted to the particular job.

This often includes safety hats, trousers, safety shoes and other items.

Industrial health and safety must go beyond the plant gate, however, Miss Anderson warned, because unsatisfactory living conditions and home accidents take a heavy toll in war work efficiency.

*Science News Letter, January 16, 1943*

## MEDICINE

**Safe Ski Binding Urged For Mountain Troops**

► THE NEW TYPE of ski binding favored by sportsmen should be abandoned by Uncle Sam's mountain troops in favor of an older style, "safe" binding, Dr. John R. Moritz, of Sun Valley, Ida., advises (*Journal, American Medical Association*, Jan. 9).

About three-fourths of all ski injuries during the past three years at Sun Valley were the result of twisting strain, Dr. Moritz reports.

"Translated into terms of disability, this represents over 90%," he adds.

This group of injuries could be reduced to a minimum, he states, by using the old style safe binding which allows the foot to become disengaged from the ski when severe twisting strain is applied. The new type of binding, developed to give greater skill in racing and greater control in making turns, limits the motion of the foot on the ski to a hingelike action of a few degrees.

"When the ski point becomes fixed in heavy snow," Dr. Moritz explains, "the foot also becomes fixed. Consequently the weight of the body going forward makes it necessary for something to give and it is usually the lower extremity."

*Science News Letter, January 16, 1943*

## PSYCHOLOGY

**Failure in School Can Be Predicted by Blot Test**

► SCHOOL SUCCESS or failure can be predicted by means of the Rorschach, or inkblot test, it is indicated by a study of 166 junior high school students by Dr. Helen Margulies of Queens College, Flushing, N. Y., (*Archives of Psychology*, July).

Psychologists have long been puzzled by the failure of intelligent pupils, reports Dr. Margulies. Previous studies using standard psychological tests and techniques, have failed to show any cogent reason for this, as one eminent psychologist put it. It was recognized that emotional problems, or maladjustment, are no guarantee of failure, any more than a high I.Q. is a guarantee of success. Some method of measuring the total personality, in response to its environment, was lacking.

The inkblot test, devised in 1911 by a Swiss psychiatrist named Rorschach, purports to be just such a method. It consists of ten inkblot pictures, five of

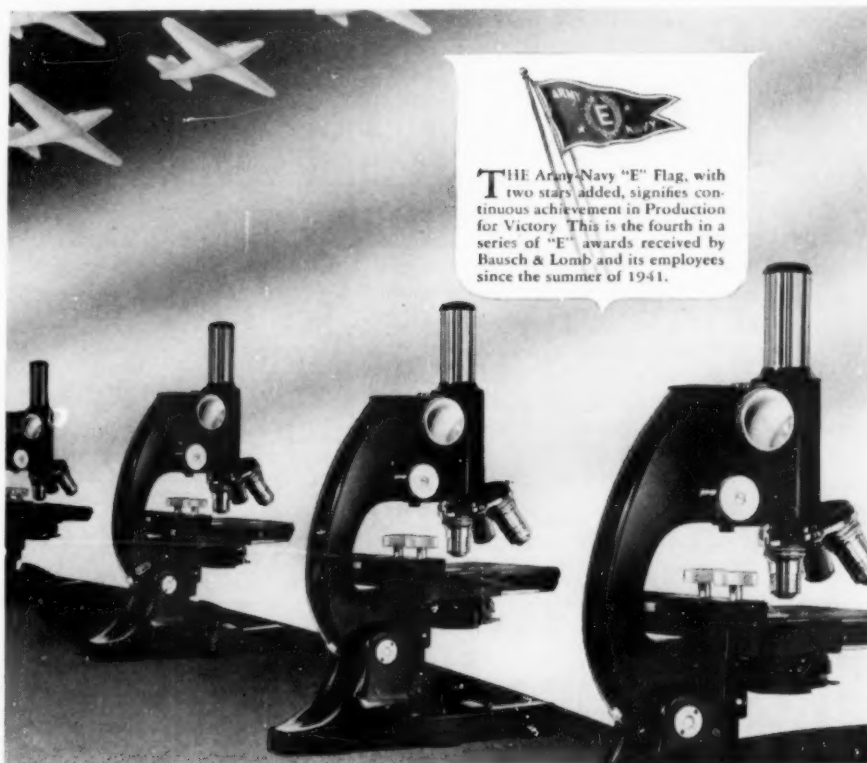
them brightly colored and five black and gray. The subject is asked to tell what he sees in them, much like seeing figures in clouds. Some patterns of response indicate normality, others schizophrenia, and so on. Experts can make very minute and specialized distinctions on the basis of ten little inkblots.

Widely used by psychiatrists to aid diagnosis, the Rorschach test had never been fully established as a method for determining the efficient or inefficient use of mental capacities, as claimed. The present study by Dr. Margulies was undertaken to investigate this claim, and

also to find out whether the Rorschach would reveal significant differences between successful and unsuccessful students. Positive results were obtained on both counts.

One hundred and sixty-six junior high students of above-average or superior intelligence were given Rorschach tests. Those who were failing in school-work showed certain combinations of traits and the successful group showed significantly different combinations, which can be used to predict success or failure, according to Dr. Margulies.

*Science News Letter, January 16, 1943*

**Sentries Along America's Battle Lines**

IN white-walled hospital laboratories, in industrial research laboratories, in field laboratories, microscopes in the hands of American doctors and scientists are on twenty-four hour sentry duty.

Here, on America's second front, microscopists are waging an unending war against enemies of health and production, enemies that are invisible to the unaided eye.

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effort is geared, to the microscope of the medical officer fighting the hazards to health which, if unchecked, could put a division out of action, B&L instruments, through the men using them, are serving America.

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## WILDLIFE—AGRICULTURE

# Corn Shocks Waste Food

► CORN SHOCKS standing in the winter fields may be picturesque, but they are highly unprofitable. Field mice get too much of the corn before the farmer gets around to husking it.

Such at least is the evidence produced by a series of experiments carried out by J. P. Linduska of the Michigan State Department of Conservation.

Mr. Linduska set up ten experimental shocks of corn, in several typical farmland environments. He screened them to keep out game animals like rabbits, squirrels and pheasants, but left free access for field mice of several species. Finally, early in the spring, he removed the remaining corn and compared its weight with that of corn from similar shocks that had been kept free of feeding rodents all winter.

He found that the wild mice had eaten 17% of the corn in shocks set in open cornfields, and 46% in shocks set on sodded land, where conditions at the outset were favorable to the rodents. Worst destruction occurred in a shock placed near a marsh where one species was very numerous; here 85% of the corn was eaten.

The mice tended to move into the shocks and became permanent residents

for the winter. The average number of such rodent inhabitants was 1.5; largest in any one shock was 11. Winter breeding went on at a lively rate.

Mr. Linduska presents detailed results of his studies in the *Journal of Wildlife Management*.

*Science News Letter, January 16, 1943*

## PUBLIC HEALTH

## Increasing Death Rate Sign of Doctor Shortage

► A HINT that the doctor shortage is already affecting the national health picture may be found in the death rate for the nation's 88 largest cities. For the week ending Dec. 5, latest on which figures are available, this took a big jump, to 13.5 per 1,000, although there are no signs of any epidemics.

The increase was largely due to the mortality from the Boston night club fire, but correcting for this gives a death rate for the large cities of 12.8 per 1,000. The rate for the corresponding week in 1941 was 11.9 per 1,000, and the three-year average for the first week in December is also 11.9 per 1,000.

The death rate of 13.5 per 1,000 for the 88 large cities comes from the Cen-

sus Bureau, and is based on total number of deaths without regard to cause, age or other factors. The U. S. Public Health Service, however, gets weekly reports from 88 large cities on pneumonia and influenza deaths. These are not all the same cities as covered by the Census Bureau weekly report. Different cities are included in order to get a better geographic picture of the influenza-pneumonia situation. The death rate for influenza and pneumonia based on the reports from these cities is also running higher than the average for the past three years at this season.

Influenza cases reported by state health officers to the U. S. Public Health Service increased somewhat during the week ending Dec. 5, but neither the increase nor the total number of cases is large enough to indicate any epidemic.

With no epidemic and no reports so far of a more virulent type of pneumonia or influenza, the only suggested explanation for the increased death rate is lack of medical care resulting from the doctor shortage among civilians.

*Science News Letter, January 16, 1943*

## GEOLOGY

## Women to Be Trained As Petroleum Geologists

► WOMEN will be trained in petroleum geology by a specially designed one-year course starting at the University of Michigan next month.

Such women are needed to help develop new oil fields so important to the war effort.

Admission requirements to the concentrated program include a year's work in physical and historical geology and trigonometry, with a B average.

*Science News Letter, January 16, 1943*

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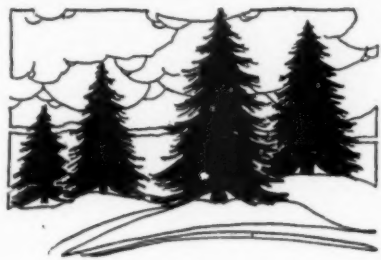
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METEOROLOGY—ECOLOGY

## NATURE RAMBLINGS

by Frank Thone



### Soil-Saving Snow

► WINTER is often thought of as a period of hardship on the farm, of enforced inactivity on the part of farmers. True, in the North the soil is frozen, and men can neither plow nor plant. Snow lies on the ground, often covering it deeply for weeks on end. The frozen time therefore seems a useless time, and spring and summer and autumn are looked upon as the useful seasons.

Actually, it is not so. It would be well for farms in the South if they, too, could be deeply covered with snow for a part of the year. For the snow is a great soil-saver. So long as the soil is frozen hard or covered with the white blanket, it is in no condition to be eroded by water or wind. Unfrozen and naked soil, beaten by winter rains as in the South or pulled at by winter winds as sometimes in the West, has little resistance, little protection. The dreadful dust storms of the mid-thirties, that sometimes darkened even Eastern skies, blew off lands in the West that had been denied their winter snow covering by year-long droughts.

Snow cover is not only a protection against the destructive action of falling water; it is a source of moisture of the most useful kind, when spring thaws release it. Unless the land slopes too much or the thaws come too suddenly, snow water is rarely a cause of erosion. It turns from solid to liquid gradually, soaking into the ground where it will later benefit plant growth or seep slowly down to emerge as springs for thirsty animals.

Snow benefits the plants that it covers, too. A snow blanket may not be as warm as wool, but it is not as cold as it looks, either. The soil under snow is always at least a few degrees warmer

than the air immediately above it, so that hardy plants really do get a temperature benefit.

Even more important, however, is the protection snow gives against too rapid changes from cold to warm, or vice versa, when sudden thaws come in mid-winter, followed by equally sudden freezes. These sudden shifts in temperature can do immense mischief to plants, either by thawing, then re-freezing, the water in their tissues, with the formation of expanding, rupturing crystals; or by causing "heaving" in the soil, uprooting and overturning insecurely-rooted winter biennials.

Snow also protects plants in a third way. One of the worst things that can happen to many plants is to be exposed to dry winter winds which evaporate moisture from their tissues when they have no chance to replace it from the frozen soil. Snow cuts this evaporation nearly to zero, saving the plants from death by frozen drought.

*Science News Letter, January 16, 1943*

*Floating glass*, designed for lifesaving devices, weighs ten pounds per cubic foot and can be sawed, drilled, and worked in the ordinary manner.

#### CHEMISTRY

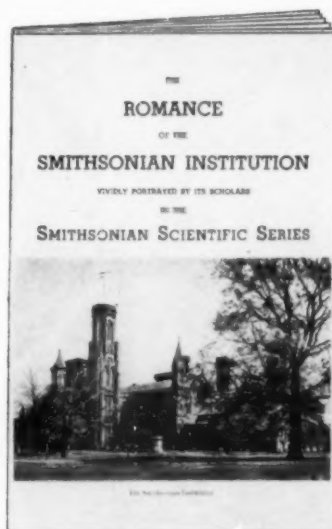
### Dr. Robert E. Wilson Awarded Perkin Medal

► FOR OUTSTANDING work in applied chemistry, Dr. Robert E. Wilson, president of Pan American Petroleum and Transport Company received the Perkin Medal from the American Section of the Society of Chemical Industry at the organization's meeting on Jan. 8.

Research on such varied subjects as flow of fluids, corrosion, motor fuel volatility and contributions in the use of tetraethyl lead, has earned Dr. Wilson the award. He has over 90 patents to his credit. In succession, he has held the post of research director at Massachusetts Institute of Technology, the Chemical Warfare Service and Standard Oil Company of Indiana.

The award program honoring this record featured Dr. Thomas Midgley of the Ethyl Gasoline Corporation and Dr. Walter G. Whitman of Massachusetts Institute of Technology. Presentation of the Perkin Medal was made by Dr. Marston T. Bogert of Columbia University.

*Science News Letter, January 16, 1943*



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# • New Machines and Gadgets •

✿ FOR AN EXTRA ROOM, you can build partitions with glass blocks and interlocking wooden strips, now being manufactured.

Science News Letter, January 16, 1943

✿ SOLUTION to the heating problem: spend those long winter evenings in the bathtub with a good book. All you need is the new combination towel-rack and bookholder attached to the wall.

Science News Letter, January 16, 1943

✿ AN IMPROVED SANDING apparatus for icy roads distributes the sand uniformly, permits increased amounts where needed, and has a heater which causes the grains to adhere to the ice through partial melting and re-freezing. This not only gives the ice-sheathed road a better traction surface, but prevents the sand from being blown and scattered.

Science News Letter, January 16, 1943

✿ AN ILLUMINATED HANDBAG recently patented lights up inside when it is opened. This should be a boon to all males who have ever waited on cold doorsteps while a lady found her key.

Science News Letter, January 16, 1943

✿ "POWER BOTTLES", steel cylinders full of highly-compressed carbon dioxide, are making bombing trips safer for crew members. By a twist of the wrist, a pilot can release the gas into the plane's hydraulic system in case it is put out of order by enemy attack. With an 80 horsepower wallop, the expanding gas pushes down stuck landing wheels, opens bomb-bay doors, or puts on jammed landing brakes.

Science News Letter, January 16, 1943

✿ PLASTIC TIRES have been molded for wheeled restaurant equipment and industrial hand trucks. The phenol-formaldehyde product gives extremely good wear and rolls more easily than rubber tires, although noisier and less resilient.

Science News Letter, January 16, 1943

✿ PRESENT MACHINERY for processing natural rubber can also be used to mix synthetic rubber by a technique developed at one of the large rubber companies. The information is being passed on to the entire industry. This dispels fears that new, complicated machinery made of critical materials, would

be necessary before the synthetic rubber program could get into full swing.

Science News Letter, January 16, 1943

✿ A CONTINUOUS bleaching process using hydrogen peroxide turns cloth white in two hours at rates up to 200 yards per minute, replacing the old

"batch" bleaching which required eight to 24 hours. Military textiles are thus being processed at unprecedented speeds.

Science News Letter, January 16, 1943

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 139.

## First Glances at New Books

➤ IN STRAIGHT FORWARD STYLE, mixing the old with the new, the part that science is playing in our modern world is told in SCIENCE REMAKES OUR WORLD by James Stokley, (*Ives Washburn*, \$3.50). There is little accent upon war and the military uses of science. Rather, there is backgrounding of the science of today and tomorrow.

Science News Letter, January 16, 1943

➤ MAP READING is simply, vividly and compellingly presented in How to READ MILITARY MAPS, by Roderick Peattie (*George W. Stewart*, \$1.50). It will be useful not only to soldiers and marines now, but to the young people who will presently be in service.

Science News Letter, January 16, 1943

➤ TEN YEARS of working with students in a large university teaches psychiatrists much, not only about emotional problems in college life, but mental health in general. Recommended for the general reader as well as the specialist, is MENTAL HEALTH IN COLLEGE by Clements C. Fry, and Edna G. Rostow (*Commonwealth Fund*, \$2).

Science News Letter, January 16, 1943

➤ GUIDE TO EASTERN FERNS, by Edgar T. Wherry (*Science Press*, \$1), appears in a new edition, this time with an analytical key. This small but highly successful book is useful not only to the trained botanist but to all who are really interested in wild plants.

Science News Letter, January 16, 1943

## • Just Off the Press •

AERO-ENGINES—D. Hay Surgeoner—*Longmans, Green*, 110 p., illus., \$1.25 (Air Training Series). Elementary book of British origin.

BIOCHEMISTRY AND MORPHOGENESIS — Joseph Needham—*Macmillan*, 787 p., illus., \$12.50.

THE CONQUEST OF BACTERIA—F. Sherwood Taylor—*The Philosophical Library*, 178 p., illus., \$2.

CONVERSACION: Spanish for the Army and Navy of the United States — Henry V. Besso and Solomon Lipp—*Hastings House*, 294 p., illus., \$1.50. The authors recommend that this book be used with the textbook, "Conversational Spanish."

DIET WITHOUT DESPAIR—Marion White—*M. S. Mill*, 128 p., \$1.50.

THE EFFECTS OF WHITE CONTACT UPON BLACKFOOT CULTURE, with Special Reference to the Role of the Fur Trade — Oscar Lewis — *Augustin*, 73 p., \$1.50. (Monographs of the American Ethnological Society, VI).

THE FLAG OF THE U. S. — Milo Milton Quaife—*Grossett & Dunlap*, 210 p., illus., \$2. For young people.

THE FLIGHT OF THE CHIEFS: Epic Poetry

of Fiji—Buell H. Quain—*Augustin*, 248 p., illus., \$4.

FLYING AND WEATHER — Lili Heimers — *New Jersey State Teachers College*—23 p., 50c. (Audio-visual and teaching aids, 1942). Paper-bound, mimeographed.

JORDANOFF'S ILLUSTRATED AVIATION DICTIONARY — Assen Jordanoff — *Harper* — 415 p., illus., \$3.50. An illustrated alphabet approach to aviation, from "A" to "W" for widget.

NATURE LORE: LISTEN TO THE VOICE OF NATURE—H. P. K. Agersborg—C. C. Nelson, five volumes, illus., \$10, or \$2 per volume.

A PRIMITIVE MEXICAN ECONOMY—George M. Foster—*Augustin*, 115 p., illus., \$2. (Monographs of the American Ethnological Society, V).

RADIO: From Start to Finish—Franklin M. Reck—*Crowell*, 160 p., illus., \$2. A brief history of radio, nicely illustrated.

VEGETABLE GARDENING IN COLOR—Daniel J. Foley—*Macmillan*, 255 p., illus., \$2.50. Subjects arranged in alphabetical order.

TABLES OF FOOD VALUES—Alice V. Bradley—*Manual Arts Press*—224 p., \$3.50. Revised and enlarged edition.